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10/045,380	10/26/2001	Wilfried Nisch	59387-84 D1	2366

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EXAMINER

NOGUEROLA, ALEXANDER STEPHAN

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,380

Applicant(s)

NISCH ET AL.

Examiner

ALEX NOGUEROLA

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-47 is/are pending in the application.
- 4a) Of the above claim(s) 42-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 30-33, 36-39 and 41 is/are rejected.
- 7) ☒ Claim(s) 34, 35 and 40 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/311,780.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/26/2001.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 30-41, drawn to a method of making contact to cells, classified in class 205, subclass 777.5.
 - II. Claims 42-47, drawn to a method of manufacturing a microelement device, classified in class 156, subclass 272.2.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group I and Group II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention of Group I has separate utility such as with a microelement device that does not have a base plate or a cover plate located thereabove. See MPEP § 806.05(d).

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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4. During a telephone conversation with Claude Hamrick on December 14, 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 30-41. Affirmation of this election must be made by applicant in replying to this Office action. Claims 42-47 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 37 recites the limitation "the attractive force" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 30, 31, 36-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Hatschek et al. (US 5,489,515) (“Hatschek”).

Addressing claim 30, Hatschek discloses a method for making contact to cells present in a liquid environment

above a substrate, the method comprising the steps of

creating electrical microelements (implied by Figures 2 and 4; since microelements are disclosed they must have been created);

creating a contact between the cells and the microelements (col. 10:7-13); and

creating a force for guiding the cells (col. 9:10-14 and col. 10:13-15).

Addressing claim 31, for the additional limitation of this claim see col. 9:10-15.

Addressing claim 36, since the attractive force draws the cells to the microelements

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(col. 10:13-15) it is exerted as a contact force between the cells and the microelements.

Addressing claim 37, since the attractive force draws the cells to the microelements (col. 10:13-15).

Addressing claim 38, the guiding force polarizes the cells (dielectrophoresis). Barring a contrary showing, polarizing cells is a type of stimulation.

Addressing claim 39, for sensing potentials see col. 9:29-38, for example.

10. Claims 30, 33, and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Pethig et al. (US 5,814,200) ("Pethig").

Addressing claim 30, Pethig discloses a method for making contact to cells present in a liquid environment above a substrate, the method comprising the steps of creating electrical microelements (implied by Figures 6 and 11; since microelements are disclosed they must have been created); creating a contact between the cells and the microelements (Figures 14b and 17); and creating a force for guiding the cells (Figures 11, 12, and 26; col. 14:51-65; and col. 2:25-51).

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Addressing claim 33, Pethig discloses using pumps to create the force (col. 14:51-65; and col. 2:25-51).

Addressing claim 41, Pethig discloses measuring light absorption of the cells. See Figure 23 and col. 20:7-14.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pethig et al. (US 5,814,200) ("Pethig") in view of Crane (US 5,489,506) ("Crane").

Pethig discloses a method for making contact to cells present in a liquid environment above a substrate, the method comprising the steps of

creating electrical microelements (implied by Figures 6 and 11; since microelements are disclosed they must have been created);

creating a contact between the cells and the microelements (Figures 14b and 17); and

creating a force for guiding the cells (Figures 11, 12, and 26; col. 14:51-65; and col. 2:25-51).

Although Pethig discloses using pumps to create the force (col. 14:51-65; and col. 2:25-51), Pethig does not *mention* a negative-pressure force. Pethig arguably discloses a negative-pressure force, though, because Pethig discloses pumps upstream of the flow (pumps 23 and 24 in Figure 11, for example). Crane discloses a dielectrophoretic cell stream sorter that uses vacuum pumps to guide the cells. See the title and abstract. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use a negative-pressure force as taught by Crane in the invention of Pethig because as taught by Crane the fluid flow will be smoother and less turbulent than with a positive-pressure force. See col. 5:1-24.

Allowable Subject Matter

15. Claims 34, 35, and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter:

a) Claim 34: the combination of limitations requires that the hydrodynamic force be exerted by electroosmosis. Pethig and Pethig as modified by Crane create the hydrodynamic force using mechanical pumps;

b) Claim 35: the combination of limitations requires that the force be exerted as an attractive force on the basis of electrical charging of the cells and an electrical field acting in the direction of the electrodes. Hatschek exerts an attractive force on the basis of *polarizing* the cells and an electrical field acting in the direction of the electrodes (dielectrophoresis¹);

c) Claim 40: the combination of limitations requires “the step of sensing the luminescence of the cells via the microelements which are configured as

microphotodiodes.” Hatschek performs electrochemical detection. Pethig discloses optical detection; however, uses a microscope and a UV/Vis spectrometer (Figure 23 and col. 20:7-14);

d) WO 96/32467 A1 was cited as an “X” reference against claim 37 in the Search Report for PCT/EP97/06285. However, in the International Examination Report all claims were deemed free of WO 96/32467 A1. It does not disclose “creating a force for guiding the cells” as required by claim 30, from which claim 37 depends. In WO 96/32467 A1 the cells are either cultured in situ or placed on the microelements. See page 6, penultimate paragraph. The inlet capillary to the cell chamber shown in Figure 10 is to perfuse the cells;

e) WO 85/02201 A1 was cited as an “Y” reference against claims 31, 33-35, and 37 in the Search Report for PCT/EP97/06285, although no particular portion of the reference was cited. However, in the International Examination Report all claims were deemed free of WO 85/02201 A1. Claims 31, 33, and 37 have already been rejected, so WO 85/02201 A1, if applicable, would be duplicative with regard to these claims. Furthermore, WO 85/02201 A1 does not appear to disclose electrical microelements contacted with cells, which is required by claim 30, from which claims 31, 33-35, and 37 depends. Although the carrier (1) can be made of electrically conductive material (bottom of page 5) it would be as a unit, not as a plurality of distinct electrical microelements.

¹ “dielectrophoresis [PHYSICAL CHEMISTRY] The ability of an uncharged material to move when subjected to an

Also, claim 34 requires the hydrodynamic force to be electroosmosis. WO 85/02201 A1 does disclose using an electric field to drive the cells (page 11, third full paragraph), but the cells are charged so the hydrodynamic force is akin to electrophoresis, not electroosmosis. Claim 35 requires electrically charging the cells. WO 85/02201 A1 uses pH to charge the cells (page 11, third full paragraph); and

f) EP 0689051 A1 was cited as an “Y” reference against claims 31 and 33-35 in the Search Report for PCT/EP97/06285, although no particular portion of the reference was cited. However, in the International Examination Report all claims were deemed free of EP 0689051 A1. It does not disclose “creating a force for guiding the cells” as required by claim 30, from which claims 31 and 33-35 depend. In EP 0689051 A1 the cells are either cultured in situ or placed on the microelements. See col. 2: 44-58; col. 17:24-34; and claims 3 and 4, penultimate paragraph.

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Information Disclosure Statement

17. In the response to this Office action Applicants are requested to provide a copy of WO 85/92201, which was cited on the Information Disclosure Statement of October 26, 2001, but not found in the parent application.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alex Noguerola
Primary Examiner
AU 1753

January 7, 2005